—(r) title:"RWORKSHEET4B_CAMAYODO" author: "ANN MARGARET CAMAYODO" date: "2023-11-08" output: pdf_document —

1. Using the for loop, create an R script that will display a 5x5 matrix as shown in Figure 1. It must contain vectorA = [1,2,3,4,5] and a 5 x 5 zero matrix.

```
vectorA <- c(1,2,3,4,5)

matrixA <- matrix(0,nrow = 5, ncol =5)

for (i in 1:5)
  for (j in 1:5)
  {
    matrixA[i,j] <- abs (vectorA[i] - vectorA[j])
  }

matrixA
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    0    1    2    3    4
## [2,]    1    0    1    2    3
## [3,]    2    1    0    1    2
## [4,]    3    2    1    0    1
## [5,]    4    3    2    1    0
```

2. Print the string "*" using for() function. The output should be the same as shown in Figure 2

```
for (i in 1:5) {
  cat(paste0("\"", rep("*", i), "\""), "\n")
}
```

```
## "*"
## "*" "*"
## "*" "*" "*"
## "*" "*" "*" "*"
## "*" "*" "*" "*" "*"
```

3. Get an input from the user to print the Fibonacci sequence starting from the 1st input up to 500. Use repeat and break statements. Write the R Scripts and its output.

```
# Get user input
n <- as.integer(readline(prompt = "Enter the number of terms: "))
```

```
## Enter the number of terms:
```

```
# Initialize variables
a <- 0
b <- 1

# Print Fibonacci sequence
cat("Fibonacci sequence:", a, b)
```

```
## Fibonacci sequence: 0 1
```

```
# Generate Fibonacci sequence
repeat {
  next_term <- a + b
  if (next_term > 500) {
    break
```

```
  }
  cat(next_term, " ")
  a <- b
  b <- next_term
}
```

```
## 1  2  3  5  8  13  21  34  55  89  144  233  377
```

4.Import the dataset as shown in Figure 1 you have created previously. 4a.What is the R script for importing an excel or a csv file? Display the first 6 rows of the dataset? Show your codes and its result

```
accessData <- read.csv("shoes.z.csv")
head(accessData)
```

```
##   X Shoe_Size Height Gender
## 1 1       6.5   66.0      F
## 2 2       9.0   68.0      F
## 3 3       8.5   64.5      F
## 4 4       8.5   65.0      F
## 5 5      10.5   70.0      M
## 6 6       7.0   64.0      F
```

4b. Create a subset for gender(female and male). How many observations are there in Male? How about in Female? Write the R scripts and its output.

```
male_subset <- subset(accessData, Gender == "M")
male_subset
```

```
##     X Shoe_Size Height Gender
## 5   5      10.5   70.0      M
## 9   9      13.0   72.0      M
## 11 11      10.5   74.5      M
## 13 13      12.0   71.0      M
## 14 14      10.5   71.0      M
## 15 15      13.0   77.0      M
## 16 16      11.5   72.0      M
## 19 19      10.0   72.0      M
## 22 22       8.5   67.0      M
## 23 23      10.5   73.0      M
## 25 25      10.5   72.0      M
## 26 26      11.0   70.0      M
## 27 27       9.0   69.0      M
## 28 28      13.0   70.0      M
```

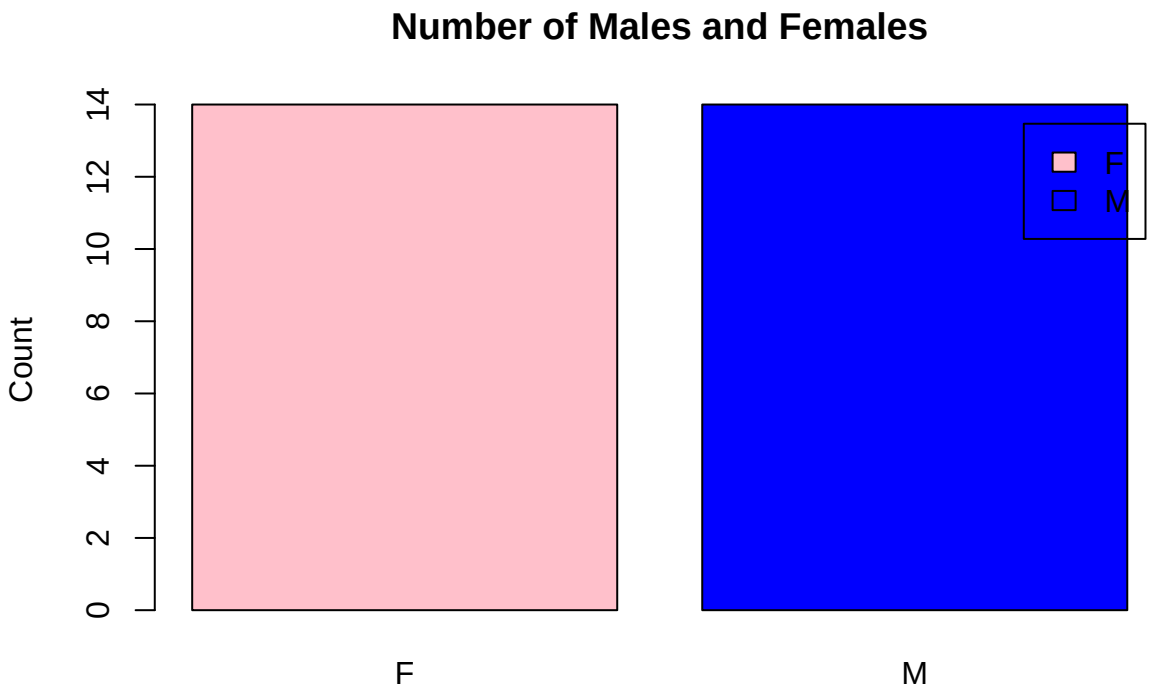
```
female_subset <- subset(accessData, Gender == "F")
female_subset
```

```
##     X Shoe_Size Height Gender
## 1   1       6.5   66.0      F
## 2   2       9.0   68.0      F
## 3   3       8.5   64.5      F
## 4   4       8.5   65.0      F
## 6   6       7.0   64.0      F
## 7   7       9.5   70.0      F
## 8   8       9.0   71.0      F
## 10 10       7.5   64.0      F
## 12 12       8.5   67.0      F
```

```
## 17 17       8.5   59.0      F
## 18 18       5.0   62.0      F
## 20 20       6.5   66.0      F
## 21 21       7.5   64.0      F
## 24 24       8.5   69.0      F
```

4c. Create a graph for the number of males and females for Household Data. Use plot(), chart type = barplot. Make sure to place title, legends, and colors. Write the R scripts and its result

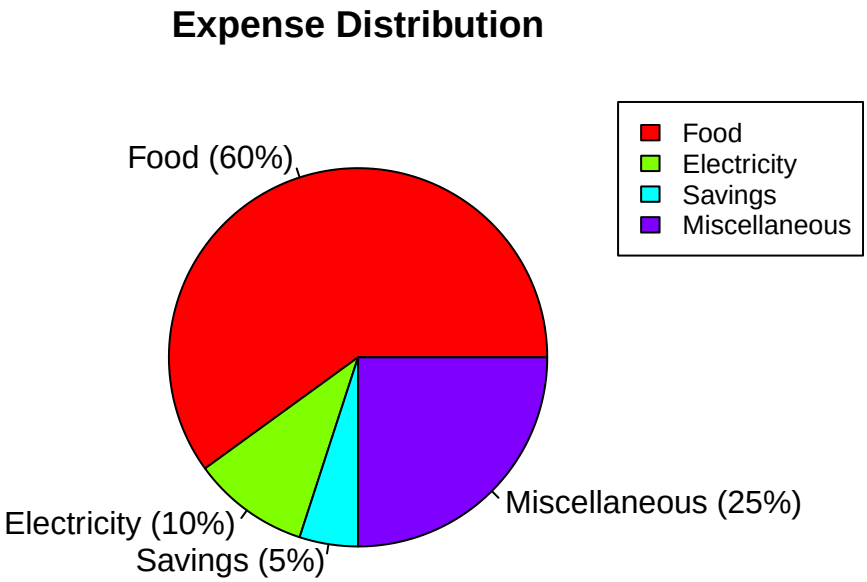
```
totalMaleFemale <- table(accessData$Gender)
barplot(totalMaleFemale,
        main = "Number of Males and Females",
        xlab = "Gender",
        ylab = "Count",
        col = c("pink", "blue"),
        legend.text = rownames(totalMaleFemale),
        beside = TRUE)
```



5. The monthly income of Dela Cruz family was spent on the following: Food Electricity Savings Miscellaneous 60 | 10 | 5 | 25 5a. a. Create a piechart that will include labels in percentage.Add some colors and title of the chart. Write the R scripts and show its output.

```
# Define the data
data <- c(Food = 60, Electricity = 10, Savings = 5, Miscellaneous = 25)

# Calculate percentages and format them as strings
percentages <- paste(round(100 * data / sum(data), 1), "%", sep = "")

# Create a pie chart
pie(data, labels = paste(names(data), " (", percentages, ")", sep = ""), col = rainbow(length(data)), ma

# Add a legend
```

```
legend("topright", names(data), cex = 0.8, fill = rainbow(length(data)))
```



6. Use the iris dataset

```
data(iris)
```

6a. Check for the structure of the dataset using the str() function. Describe what you have seen in the output.

```
str(iris)
```

```
## 'data.frame':    150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
##  $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```
# The dataset contains information on iris blossoms. It contains information on the length and width of
```

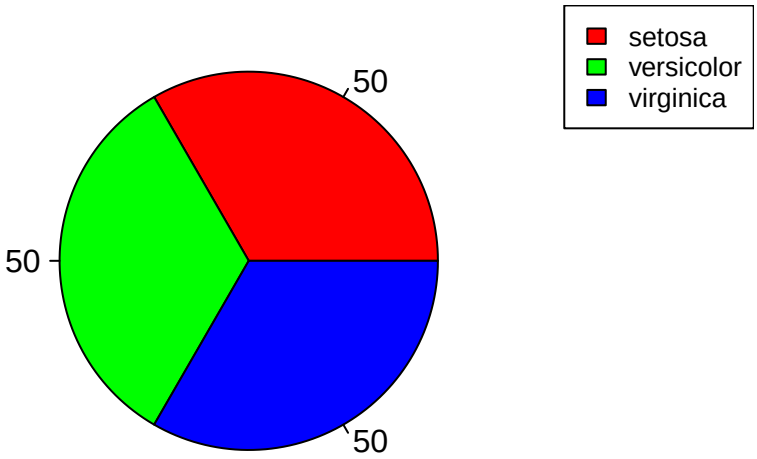
6b.Create an R object that will contain the mean of the sepal.length, sepal.width,petal.length,and petal.width. What is the R script and its result?

```
meanOfFlowers <- colMeans(iris[,1:4])
meanOfFlowers
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##     5.843333     3.057333     3.758000     1.199333
```

6c. Create a pie chart for the Species distribution. Add title, legends, and colors. Write the R script and its result.

```
species_count <- table(iris$Species)
pie(species_count, labels = species_count, col = rainbow(length(species_count)), main = "Species Distri
legend("topright", names(species_count), cex = 0.8, fill = rainbow(length(species_count)))
```



6d.Subset the species into setosa, versicolor, and virginica. Write the R scripts and show the last six (6) rows of each species.

```
# Subset the iris data set into the three species.
setosa_subset <- subset(iris, Species == "setosa")
versicolor_subset <- subset(iris, Species == "versicolor")
virginica_subset <- subset(iris, Species == "virginica")

# Display the last six rows of each species.
tail(setosa_subset, 6)
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 45          5.1         3.8          1.9         0.4  setosa
## 46          4.8         3.0          1.4         0.3  setosa
## 47          5.1         3.8          1.6         0.2  setosa
## 48          4.6         3.2          1.4         0.2  setosa
## 49          5.3         3.7          1.5         0.2  setosa
## 50          5.0         3.3          1.4         0.2  setosa
```

```
tail(versicolor_subset, 6)
```

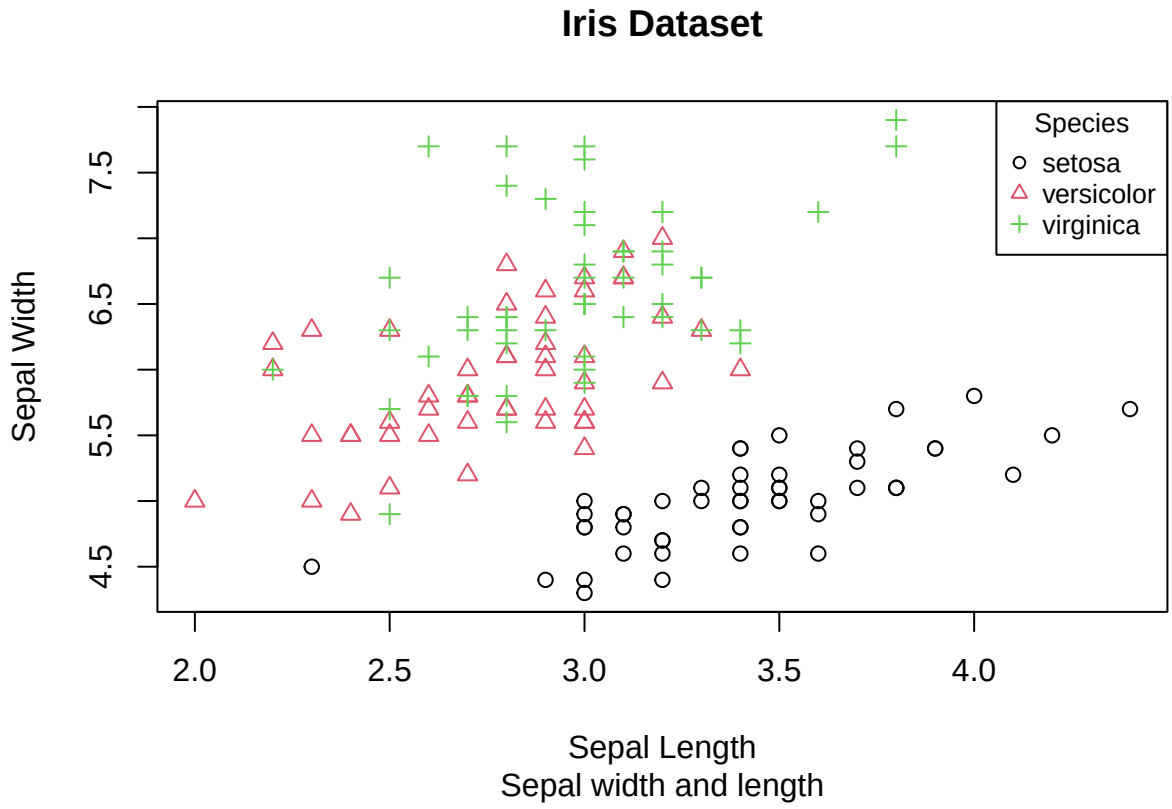
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         2.9          4.3         1.3 versicolor
## 99           5.1         2.5          3.0         1.1 versicolor
## 100          5.7         2.8          4.1         1.3 versicolor
```

```
tail(virginica_subset, 6)
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 145          6.7         3.3          5.7         2.5 virginica
## 146          6.7         3.0          5.2         2.3 virginica
## 147          6.3         2.5          5.0         1.9 virginica
## 148          6.5         3.0          5.2         2.0 virginica
## 149          6.2         3.4          5.4         2.3 virginica
## 150          5.9         3.0          5.1         1.8 virginica
```

6e. Create a scatterplot of the sepal.length and sepal.width using the different species(setosa,versicolor,virginica). Add a title = "Iris Dataset", subtitle = "Sepal width and length, labels for the x and y axis, the pch symbol and colors should be based on the species.

```
# Convert the "Species" column to a factor
iris$Species <- as.factor(iris$Species)

# Create a scatterplot
plot(
  Sepal.Length ~ Sepal.Width,
  data = iris,
  pch = as.integer(iris$Species),  # Use different pch symbols for each species
  col = as.integer(iris$Species),  # Use different colors for each species
  xlab = "Sepal Length",
  ylab = "Sepal Width",
  main = "Iris Dataset",
  sub = "Sepal width and length"
)

# Add a legend
legend("topright", legend = levels(iris$Species), col = 1:3, pch = 1:3, cex = 0.8, title = "Species")
```



6f.Interpret the result.

```
# The dataset consists of five variables (columns) and 150 observations (rows) in a data frame format.
# Petal.Length, Petal.Width, Sepal.Length, and Sepal. Width are the names of the four numerical variabl
# The factor variable Species, which represents the species of iris flowers, is the sixth variable. The
```

7.Import the alexa-file.xlsx. Check on the variations. Notice that there are extra whitespaces among black variants (Black Dot, Black Plus, Black Show, Black Spot). Also on the white variants (White Dot, White

Plus, White Show, White Spot).

```
library(readxl)
alexa_file <- read_excel("File ALxa.xlsx")
alexa_file
```

```
## # A tibble: 3,150 x 5
##    rating date                variation           verified_reviews      feedback
##     <dbl> <dttm>              <chr>               <chr>                    <dbl>
##  1      5 2018-07-31 00:00:00 Charcoal Fabric     Love my Echo!                1
##  2      5 2018-07-31 00:00:00 Charcoal Fabric     Loved it!                    1
##  3      4 2018-07-31 00:00:00 Walnut Finish       Sometimes while play~        1
##  4      5 2018-07-31 00:00:00 Charcoal Fabric     I have had a lot of ~        1
##  5      5 2018-07-31 00:00:00 Charcoal Fabric     Music                        1
##  6      5 2018-07-31 00:00:00 Heather Gray Fabric I received the echo ~        1
##  7      3 2018-07-31 00:00:00 Sandstone Fabric    Without having a cel~        1
##  8      5 2018-07-31 00:00:00 Charcoal Fabric     I think this is the ~        1
##  9      5 2018-07-30 00:00:00 Heather Gray Fabric looks great                  1
## 10      5 2018-07-30 00:00:00 Heather Gray Fabric Love it! I've listen~        1
## # i 3,140 more rows
```

7a. Rename the white and black variants by using gsub() function.

```
alexa_file$variation <- gsub("Black  Dot","BlackDot",alexa_file$variation)
alexa_file$variation <- gsub("Black  Plus","BlackPlus",alexa_file$variation)
alexa_file$variation <- gsub("Black  Show","BlackShow",alexa_file$variation)
alexa_file$variation <- gsub("Black  Spot","BlackSpot",alexa_file$variation)

alexa_file$variation <- gsub("White  Dot","WhiteDot",alexa_file$variation)
alexa_file$variation <- gsub("White  Plus","WhitePlus",alexa_file$variation)
alexa_file$variation <- gsub("White  Show","WhiteShow",alexa_file$variation)
alexa_file$variation <- gsub("White  Spot","WhiteSpot",alexa_file$variation)

alexa_file
```

```
## # A tibble: 3,150 x 5
##    rating date                variation           verified_reviews      feedback
##     <dbl> <dttm>              <chr>               <chr>                    <dbl>
##  1      5 2018-07-31 00:00:00 Charcoal Fabric     Love my Echo!                1
##  2      5 2018-07-31 00:00:00 Charcoal Fabric     Loved it!                    1
##  3      4 2018-07-31 00:00:00 Walnut Finish       Sometimes while play~        1
##  4      5 2018-07-31 00:00:00 Charcoal Fabric     I have had a lot of ~        1
##  5      5 2018-07-31 00:00:00 Charcoal Fabric     Music                        1
##  6      5 2018-07-31 00:00:00 Heather Gray Fabric I received the echo ~        1
##  7      3 2018-07-31 00:00:00 Sandstone Fabric    Without having a cel~        1
##  8      5 2018-07-31 00:00:00 Charcoal Fabric     I think this is the ~        1
##  9      5 2018-07-30 00:00:00 Heather Gray Fabric looks great                  1
## 10      5 2018-07-30 00:00:00 Heather Gray Fabric Love it! I've listen~        1
## # i 3,140 more rows
```

7b. Get the total number of each variations and save it into another object. Save the object as variations.RData. Write the R scripts. What is its result?

```
library("dplyr")
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
var_total <- alexa_file %>%
  count(alexa_file$variation)

var_total
```

```
## # A tibble: 16 x 2
##    `alexa_file$variation`           n
##    <chr>                        <int>
##  1 Black                          261
##  2 BlackDot                       516
##  3 BlackPlus                      270
##  4 BlackShow                      265
##  5 BlackSpot                      241
##  6 Charcoal Fabric                430
##  7 Configuration: Fire TV Stick   350
##  8 Heather Gray Fabric            157
##  9 Oak Finish                      14
## 10 Sandstone Fabric                90
## 11 Walnut Finish                    9
## 12 White                           91
## 13 WhiteDot                       184
## 14 WhitePlus                       78
## 15 WhiteShow                       85
## 16 WhiteSpot                      109
```

```
save(var_total, file = "VAR.RData")
```

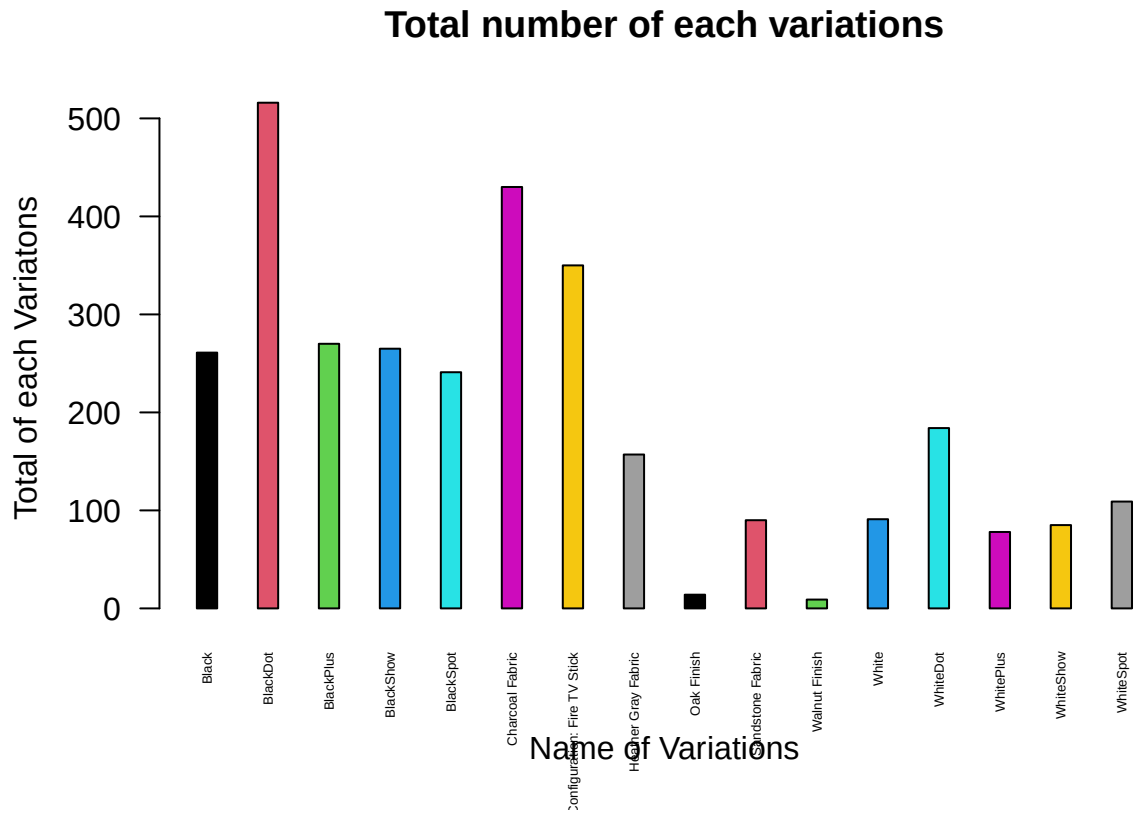
7c. From the variations.RData, create a barplot(). Complete the details of the chart which include the title, color, labels of each bar.

```
load("VAR.RData")
var_total
```

```
## # A tibble: 16 x 2
##    `alexa_file$variation`           n
##    <chr>                        <int>
##  1 Black                          261
##  2 BlackDot                       516
##  3 BlackPlus                      270
##  4 BlackShow                      265
##  5 BlackSpot                      241
##  6 Charcoal Fabric                430
##  7 Configuration: Fire TV Stick   350
##  8 Heather Gray Fabric            157
##  9 Oak Finish                      14
## 10 Sandstone Fabric                90
## 11 Walnut Finish                    9
## 12 White                           91
## 13 WhiteDot                       184
```

```
## 14 WhitePlus                        78
## 15 WhiteShow                        85
## 16 WhiteSpot                       109
```

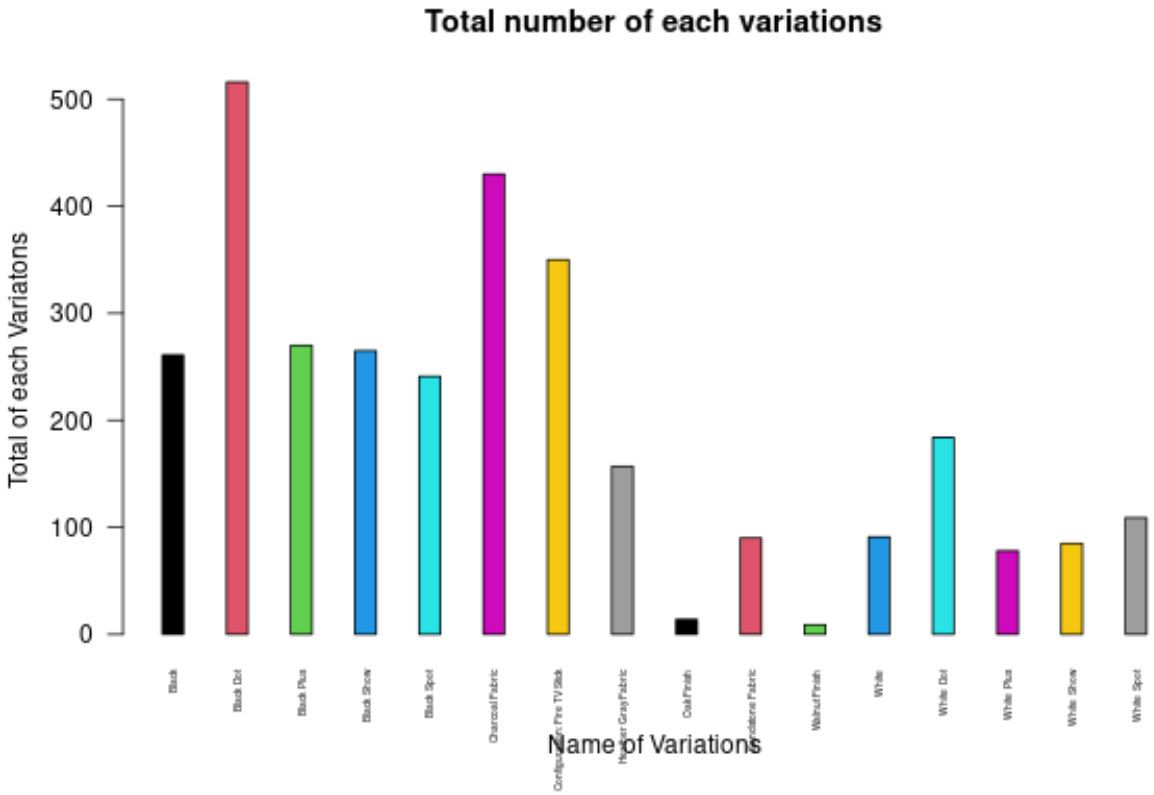
```
varNames <- var_total$`alexa_file$variation`

totalPlot <- barplot(var_total$n,
        names.arg = varNames,
        main = "Total number of each variations",
        xlab = "Name of Variations",
        ylab = "Total of each Variatons",
        col = 1:16,
        space = 2,
        cex.names = 0.4,
        las = 2 )
```




```
png("TPlot.png")
dev.off()
```

```
## pdf
##   2
```

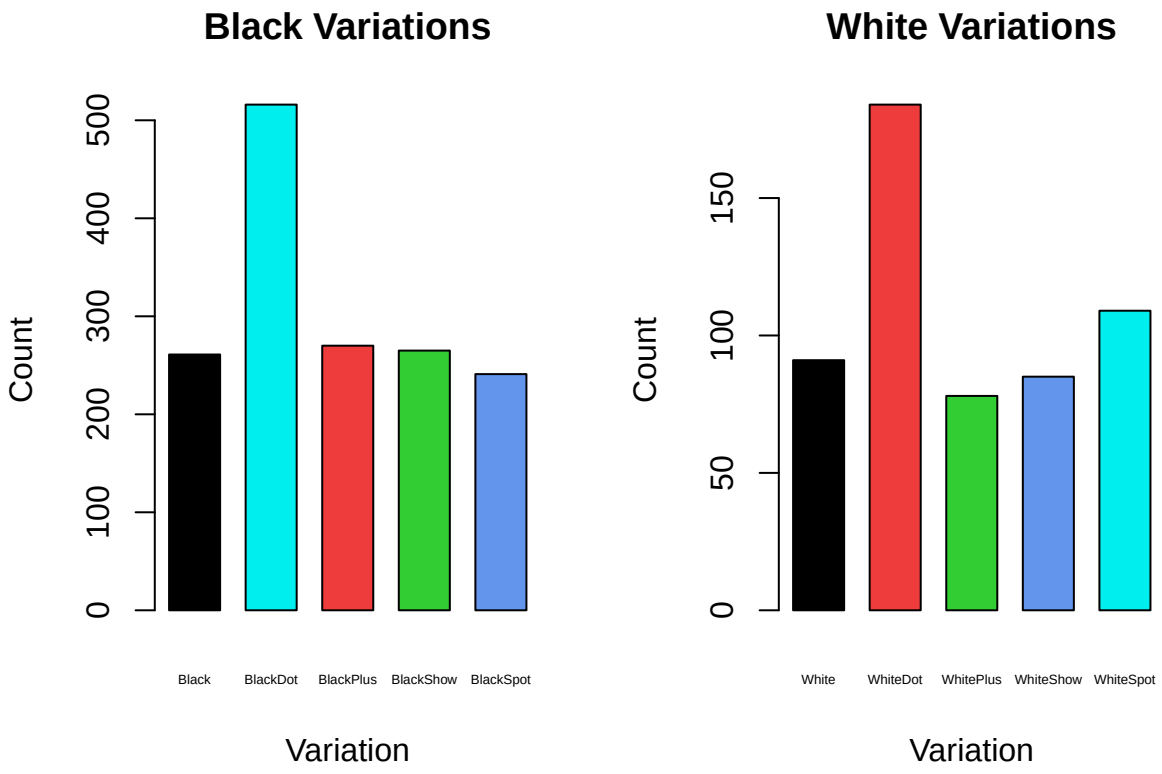
```
knitr::include_graphics("/cloud/project/rworksheet4b_camayodo/TPlot.png")
```



7d. Create a barplot() for the black and white variations. Plot it in 1 frame, side by side. Complete the details of the chart.

```
library(graphics)
blackVars <- var_total[var_total$`alexa_file$variation` %in% c("Black","BlackPlus","BlackShow","BlackSp

whiteVars <- var_total[var_total$`alexa_file$variation` %in% c("White","WhiteDot","WhitePlus","WhiteSho

par(mfrow = c(1,2))

blackPlot <- barplot(height = blackVars$n,
        names.arg = blackVars$`alexa_file$variation`,
        col = c("black","cyan2","brown2","limegreen","cornflowerblue"),
        main = "Black Variations",
        xlab = "Variation",
        ylab = "Count",
        border = "black",
        space = 0.5,
        cex.names = 0.4)


whitePlot <- barplot(height = whiteVars$n,
        names.arg = whiteVars$`alexa_file$variation`,
        col = c("black","brown2","limegreen","cornflowerblue","cyan2"),
        main = "White Variations",
        xlab = "Variation",
        ylab = "Count",
        border = "black",
```

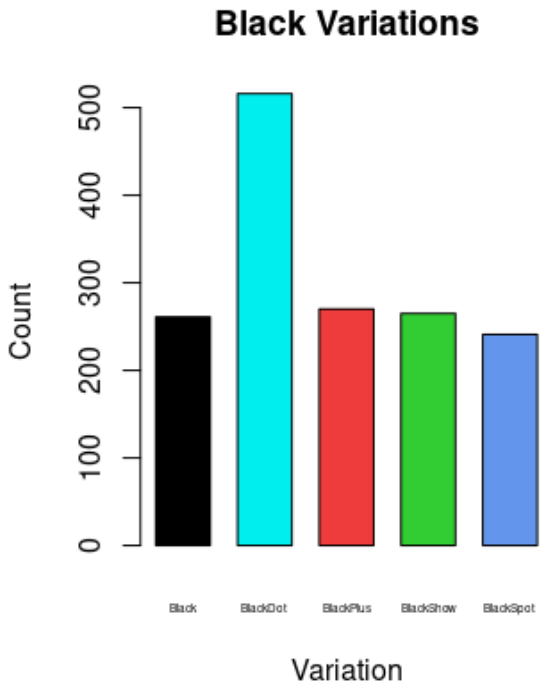
```
        space = 0.5,
        cex.names = 0.4)
```

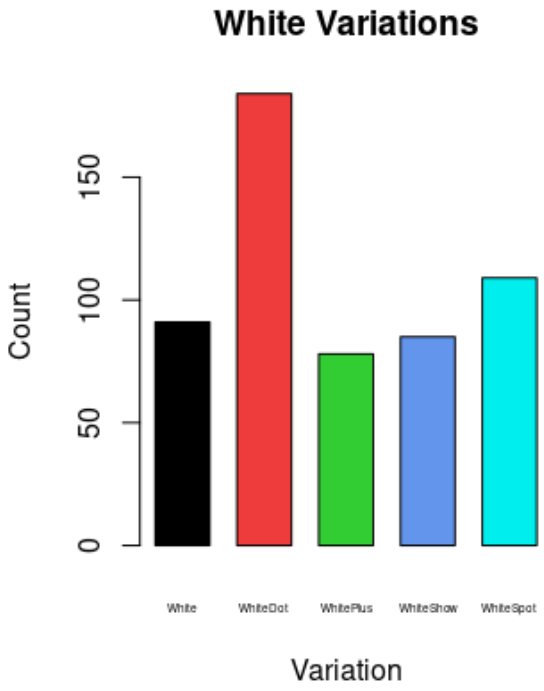



```
png("BlackN_whitePlot.png")
dev.off()
```

```
## pdf
##   2
```

```
knitr::include_graphics("/cloud/project/rworksheet4b_camayodo/BlackN_whitePlot.png")
```


Black Variations
Count
0
100
200
300
400
500
Black
BlackDot
BlackPlus
BlackShow
BlackSpot
Variation


White Variations
Count
0
50
100
150
White
WhiteDot
WhitePlus
WhiteShow
WhiteSpot
Variation